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**UNITED STATES PATENT APPLICATION FOR**  
**HOUSING FOR PORTABLE HANDHELD ELECTRONIC DEVICE**

Inventors: Gregg Wagner  
Robert Stewart

Prepared by:

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
12400 Wilshire Boulevard  
Seventh Floor  
Los Angeles, California 90025  
(310) 207-3800

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## **BACKGROUND OF THE INVENTION**

### **1. FIELD OF THE INVENTION**

The present invention relates generally to the field of housings for electronic devices. More particularly, the invention is a hermetically sealed housing for a portable handheld  
5 reader/scanner.

### **2. PRIOR ART**

Animal identification systems increasingly use electronic tags. Such tags offer numerous advantages over conventional tags, particularly in the amount of data that can be stored and retrieved with a reader.

10 Readers for electronic animal identification tags are relatively complex electronic devices, particularly if designed to operate with a variety of identification protocols. To be useful in the field, a portable reader must withstand a wide range of environmental conditions, including moisture, dust, physical abuse, etc. The housing should therefore be hermetically sealed to protect the electronic components. A portable reader/scanner should also be lightweight and  
15 ergonomically designed.

## **SUMMARY OF THE INVENTION**

The present invention provides a lightweight, ergonomic handheld portable device designed for ambidextrous use. An injection-molded housing employs a minimal number of parts and is hermetically sealed without the use of adhesives to join the component parts.

- 5        In an exemplary embodiment, the present invention provides a portable handheld scanner comprising a one-piece hollow body portion, a scan face and a handle end cap. The body portion and the scan face snap together without the need for adhesive bonding or fasteners using a tongue-and-groove closure mechanism.

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## **BRIEF DESCRIPTION OF THE DRAWINGS**

**Figure 1** is a perspective view of a portable handheld scanner housing constructed in accordance with the present invention.

**Figure 2** is an exploded view of the housing of **Figure 1**.

5      **Figure 3** is a partial cross-sectional view taken through **line 3-3** of **Figure 1**.

FIG. 1  
FIG. 2  
FIG. 3

## DETAILED DESCRIPTION OF THE INVENTION

In the following description, for purposes of explanation and not limitation, specific details are set forth in order to provide a thorough understanding of the present invention.

However, it will be apparent to one skilled in the art that the present invention may be practiced  
5 in other embodiments that depart from these specific details. In other instances, detailed descriptions of well-known methods and devices are omitted so as to not obscure the description of the present invention with unnecessary detail.

**Figure 1** illustrates an exemplary embodiment of the present invention. A portable handheld reader/scanner **10** has a hollow body portion **12** which consists of an electronics enclosure portion **14** and a barrel-grip handle portion **16**. Body portion **12** is made as a single part rather than as two joined halves. This eliminates the need for bonding or otherwise joining two halves and also eliminates the presence of an unattractive seam line. The electronics enclosure portion **14** is closed off with scan face **18**, and the handle portion is closed off with end cap **20**. Controls and displays for the operation of reader/scanner **10** are provided on the top surface of enclosure portion **14**. These include a light-emitting diode (LED) indicator **22**, a liquid crystal display (LCD) alphanumeric display panel **24**, menu and scroll buttons **26** and a power on/read button **28**. Control buttons **26** and **28** are disposed for ease of operation by the thumb of a user, regardless of which hand reader/scanner **10** is held in.

Referring now to **Figure 2**, the major components of reader/scanner **10** are shown in an exploded view. Scan face **18** snaps onto body portion **12** as will be more fully described below. A gasket **30** is applied around the perimeter of scan face **18** to aid in achieving a hermetic seal. End cap **20** attaches to the rear of body portion **12** with captive screw **32** which engages a threaded receptacle (not shown) in handle portion **16**. Gasket **34** is applied to the interface between end cap **20** and handle portion **16** to achieve a hermetic seal. Handle portion **16** is  
25 conveniently used as a compartment for batteries **36**.

Body portion 12, scan face 18 and end cap 20 are preferably made of a thermoplastic elastomer such as Santoprene® manufactured by Advanced Elastomer Systems of Akron, Ohio. This produces a housing that is watertight, buoyant and exceptionally rugged. The surface of the housing has a non-slip gripping quality even when wet and will not crack or chip, even when  
5 dropped onto concrete from a height of two meters.

The final assembly of reader/scanner 10 is accomplished with ease and at low cost. An internal electronics printed circuit board (not shown) installs into slots integrally molded in enclosure portion 12. An antenna coil (also not shown) snaps into scan face 18 without fasteners. The body portion and scan face snap together and the end cap is attached with a single  
10 captive screw.

**Figure 3** illustrates details of the mechanism for attaching scan face 18 to body portion 12. A tongue-and-groove attachment mechanism is employed which takes advantage of the elastomeric properties of the Santoprene® material. Body portion 12 has a "T" shaped tongue 40 that mates with groove 42 in the perimeter of scan face 18. Owing to the resiliency of the material of which scan face 18 is made, tongue 40 snaps into groove 42 in a manner similar to the  
15 sealing mechanism widely used for plastic storage bags. A suitable seal can be achieved without the use of a separate gasket; however, gasket 30 may be applied around tongue element 40 to improve the hermeticity of the seal.

It will be recognized that the above described invention may be embodied in other specific  
20 forms without departing from the spirit or essential characteristics of the disclosure. Thus, it is understood that the invention is not to be limited by the foregoing illustrative details, but rather is to be defined by the appended claims.